## **CLAIMS**

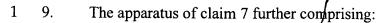
What is claimed is:

- A method comprising the steps of: 1 1. 2 sampling at least one of a tip and a ring signal to determine a line voltage and a line current of a line feed component of a subscriber loop; b) estimating an instantaneous power dissipation of the linefeed component; c) filtering the estimated instantaneous power dissipation to generate an estimated junction temperature. 2. 1 The method of claim 1 further comprising the step of: 2 d) generating a thermal alarm, if the estimated junction temperature exceeds an 3 alarm threshold. 1 3.
- The method of claim 2, further comprising the step of:
- 2 e) timesharing a same monitoring circuitry to perform steps a)-d) for each
- 3 linefeed driver component being monitored.
- 1 4. The method of claim 1 further comprising the step of:
- 2 d) programming a filter with filtering parameters corresponding to thermal 3 characteristics of the linefeed component.
- 1 5. A method comprising the steps of:
- 2 a) selecting a selected linefeed component of a plurality of linefeed
- 3 components coupled to a subscriber loop having a tip signal and ring signal;

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b) sampling at least one of the tip and the ring signals to determ	mine a voltage
and a current associated with the selected linefeed component;	
c) estimating an instantaneous power dissipation of the selected	ed linefeed
component; and	
d) filtering the estimated instantaneous power dissipation to g	enerate an
estimated junction temperature of the selected linefeed component.	
6. The method of claim 5 further comprising the step of	
e) providing a thermal alarm indicator, if the estimated junction	on temperature
exceeds an alarm threshold.	
7. A subscriber loop signal processor apparatus, comprising:	
an analog-to-digital converter (ADC) for sampling at least one of a	tip and a ring
signal;	
a power calculator coupled to calculate an instantaneous power dis	ssipation of a
selected linefeed driver component from the sampled signal and control cu	rrents provided
to a plurality of linefeed driver components; and	
a filter providing an estimated junction temperature of the selected	linefeed driver
component from the instantaneous power dissipation.	
8. The apparatus of claim 7 further comprising:	
a comparator providing an alarm indicator if the estimated junction	temperature
	c) estimating an instantaneous power dissipation of the selected component; and d) filtering the estimated instantaneous power dissipation to gestimated junction temperature of the selected linefeed component.  6. The method of claim 5 further comprising the step of e) providing a thermal alarm indicator, if the estimated junction exceeds an alarm threshold.  7. A subscriber loop signal processor apparatus, comprising: an analog-to-digital converter (ADC) for sampling at least one of a signal; a power calculator coupled to calculate an instantaneous power disselected linefeed driver component from the sampled signal and control cut to a plurality of linefeed driver components; and a filter providing an estimated junction temperature of the selected component from the instantaneous power dissipation.  8. The apparatus of claim 7 further comprising:

exceeds an alarm threshold.



- a multiplexer coupling the at least one tip and ring signal to the analog-to-digital
- 3 converter to enable providing an estimated junction temperature of any of the linefeed
- 4 components using a same ADC, power calculator, and filter.
- 1 10. The apparatus of claim 9 wherein a multiplexer control is time based to enable
- time-sharing the same ADC, power calculator, and filter for each linefeed component.
- 1 11. The apparatus of claim \( \psi\) wherein the ADC, the power calculator, and the filter
- 2 reside within a same integrated circuit package.
- 1 12. The apparatus of claim 7 further comprising:
- a re-writable nonvolatile memory coupled to provide filter parameters
- 3 corresponding to thermal characteristics of the linefeed components to the filter.
- 1 (13.) A subscriber loop interface circuit apparatus comprising:
- a signal processor having sense inputs for sensing a tip line and a ring line of a
- 3 subscriber loop, the signal processor generating subscriber loop control signals; and
- a linefeed driver for driving the subscriber loop in accordance with the subscriber
- 5 loop control signals, the linefeed driver including a tip fuse series-coupled to the tip line
- 6 and a ring fuse series-coupled to the ring line, wherein the sensed tip signal includes first
- and second sampled tip voltages sampled from opposing sides of the tip fuse, wherein the
- 8 sensed ring signal includes first and second sampled ring voltages sampled from opposing
- 9 ends of the ring fuse.

- 1 14. The subscriber loop linefeed driver of claim 13 wherein a difference between the
- 2 first and second sampled tip voltages is proportional to the tip current, wherein a
- 3 difference between the first and second sampled ring voltages is proportional to the ring
- 4 current.

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A method comprising the steps of:

generating subscriber loop control signals in response to a sensed tip signal and a sensed ring signal of a subscriber loop, wherein the tip signal is sensed before and after a tip fuse, wherein the ring signal is sensed before and after a ring fuse; and

driving the subscriber loop in accordance with the subscriber loop control signals.

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A subscriber loop interface circuit apparatus comprising:

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a signal processor having sense inputs for sensing a tip line and a ring line of a

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subscriber loop, the signal processor generating subscriber loop control signals; and

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loop control signals, the linefeed driver including a tip fuse series-coupled to the tip line

a linefeed driver for driving the subscriber loop in accordance with the subscriber

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and a ring fuse series coupled to the ring line, wherein the tip line and ring line are each

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sensed at two locations to determine both a status of each fuse and a power dissipation of

8 each linefeed driver component.